



FRAV20030009 US NP Sequence Listing.txt  
SEQUENCE LISTING

<110> AVENTIS PHARMA SA  
GUILLAUME, Jean-Marc  
DITTRICH, Werner  
PEREZ, Sandrine  
ANDREONI, Christine Michelle Pierrette  
PAILLOT, Romain

<120> METHOD FOR OBTAINING MASTOCYTE LINES FROM PIG TISSUES AND FOR PRODUCING  
HEPARIN-TYPE MOLECULES

<130> FRAV2003/0009 US NP

<140> 10/823,142  
<141> 2004-04-13

<150> 60/477,962  
<151> 2003-06-12

<150> FR 0304671  
<151> 2003-04-14

<160> 34

<170> PatentIn Ver. 2.1

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gaattcctcg agagcaggaa cgtggaaagg agctccggtc ccagagcagc caccgcgatg 120  
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|  |      |
|--|------|
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| gcaaaatcag agttaatcgt cagtgtctggc gatgagatta ggctgttctg caccgatcca | 300  |
| ggatctgtca aatggacttt tgagaccctg ggctcagctga gtgagaatac tcacgcagag | 360  |
| tggatcgtgg agaaagcaga ggccatgaat acaggcaatt atacatgcac caatgaaggc  | 420  |
| ggtttaagca gttccattta tgtgtttgtt agagatcctg agaagctttt cctcgtcgac  | 480  |
| cctcccttgt atgggaagga ggacaatgac gcgctgggtcc gctgtcctct gacggacca  | 540  |
| gaggtgacca attactccct cacgggctgc gaggggaaac cccttcccaa ggatttgacc  | 600  |
| ttcgttgacg accccaaggc cggcatacacc atcaaaaatg tgaagcgcga gtatcatcgg | 660  |
| ctgtgtctac actgctccgc caaccagggg ggcaagtccg tgctgtcgaa gaaattcacc  | 720  |
| ctgaaagtga gggcagccat cagagctgta cctgttgtgg ctgtgtccaa agcaagctac  | 780  |
| cttctcaggg aaggggagga atttgccgtg atgtgcttga tcaaagacgt gtctagtcc   | 840  |
| gtggactcca tgtggatcag ggagaacagc cagactaaag cacaggtgaa gaggaatagc  | 900  |
| tggcatcagg gtgacttcaa ttttctgcgg caggaaaaggc tgacaatcag ctcagcaaga | 960  |
| gttaatgatt ctggcgtgtt catgtgttac gccataata cttttggatc tgcaaatgtc   | 1020 |
| acaaccacct tagaagtagt agataaagga ttcattaata tcttccctat gatgaatacc  | 1080 |
| actgtgtttg taaacgatgg agaggatgtg gatctaattg ttgagtacga ggcgtacccc  | 1140 |
| aaacctgaac accgacagtg gatatatatg aaccgcactg ccactgataa gtgggaggat  | 1200 |
| tatcccaagt ctgagaatga aagtaacatc agatatgtaa gtgaacttca cttgaccaga  | 1260 |
| ttaaaaggga ccgaaggagg cacttacaca tttctcgtgt ccaatgctga tgtcaattct  | 1320 |
| tctgtgacat ttaatgttta cgtgaacaca aaaccagaaa tcctgactca tgacaggctc  | 1380 |
| atgaacggca tgctccagtg tgtggcggca ggcttcccag agcccacat cgattggtat   | 1440 |
| ttctgtccag gcaccgagca gagatgttcc gttcccgttg ggccagtgga cgtgcagatc  | 1500 |
| caaaactcat ctgtatcacc gtttggaataa ctagtgattc acagctccat tgattacagt | 1560 |
| gcattcaaac acaacggcac ggtggagtgc agggcttaca acgatgtggg caagagttct  | 1620 |
| gcctttttta actttgcatt taaagaacaa atccatgccc acaccctctt cacgcctttg  | 1680 |
| ctgattgggt ttgtgatcgc agcgggtatg atgtgtatca tcgtgatgat tctcacctat  | 1740 |
| aaatatctac agaagcccat gtatgaagta cagtggaaagg ttgtcgagga gataaatgga | 1800 |
| aacaattatg tctacataga cccaacgcaa cttccttatg atcacaaatg ggaatttccc  | 1860 |
| aggaacaggc tgagtttttg caaaaccttg ggtgctggcg ccttcgggaa agtcgttgag  | 1920 |

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|            |            |            |            |            |            |      |
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| aaaccaagtg | cccatttaac | ggaacgagaa | gccctgatgt | ctgaactcaa | agtcttaagt | 2040 |
| tacctcggtg | atcacatgaa | tattgtgaat | cttctcggcg | cctgcaccat | tggagggccc | 2100 |
| accctgggtc | ttacagaata | ttgttgctat | ggtgatctcc | tgaatttttt | gagacggaaa | 2160 |
| cgtgattcgt | ttatttgctc | aaagcaggaa | gatcacgcag | aagcggcgct | ttataagaac | 2220 |
| cttctgcatt | caaaggagtc | ttcctgcagt | gacagtacta | acgagtacat | ggacatgaaa | 2280 |
| cccggagtgt | cttatgtggt | accaaccaag | gcagacaaaa | ggagatctgc | gagaataggc | 2340 |
| tcatacatag | aacgagatgt | gactcctgcc | atcatggaag | atgatgagtt | ggccctagac | 2400 |
| ctggaggact | tgctcagctt | ttcttaccaa | gtggcaaagg | gcatggcctt | cctcgcctcg | 2460 |
| aagaattgta | ttcacagaga | cttggcggcc | agaaatatcc | tccttactca | tggtcgaatc | 2520 |
| acaaagattt | gtgattttgg | tctagccaga | gacatcaaga | atgattctaa | ttacgtggtc | 2580 |
| aaaggaaaac | ctcggctacc | cgtgaagtgg | atggcacccg | agagcatttt | caactgtgtc | 2640 |
| tacacatttg | aaagcgatgt | ctggctctat | gggatttttc | tgtgggagct | cttctcttta | 2700 |
| gggagcagcc | cctaccctgg | aatgccagtt | gattctaaat | tctacaagat | gatcaaggag | 2760 |
| ggtttccgaa | tgctcagtcc | tgagcatgca | cctgcggaaa | tgtatgacat | catgaagact | 2820 |
| tgctgggatg | cggatccctt | caaaagacca | acgtttaagc | agattgtgca | gctgattgag | 2880 |
| aagcagattt | cggagagcac | caatcacatt | tattccaact | tagcgaactg | cagcccccac | 2940 |
| cgggagaacc | ccgcggtgga | tcattctgtg | cggatcaact | ccgtgggcag | cagtgcctcc | 3000 |
| tccacgcagc | cgctgcttgt | ccacgaagac | gtctgaagca | gaatgggtgt | ccggggtggg | 3060 |
| gggtgggggg | gctcctcccc | cacagcaccg | gcctactgcc | attctttttg | gttttcataa | 3120 |
| tggttatatt | gtttcccttc | aacttgcatc | ctactccagg | gtagtggatg | ctccgctgta | 3180 |
| atcctcttta | cgagcacact | ttagtggcca | atgatttttg | tcacagctg  | ccattgagct | 3240 |
| gtatatgttc | ccaatagcac | gctagcccc  | attaacggag | agcattcaga | cttagggaag | 3300 |
| aggagggtag | gacgggtgg  | acaccccg   | tccttgacaa | gtcttctcca | gtttctgtcc | 3360 |
| aataagtgct | gtaatggttt | atttgagcac | ctggctgtcg | tcacctccgg | tccttgtcat | 3420 |
| catctgtaac | aatatgatga | tgatgatgcc | agaaccta   | cccttgatgt | ggaaaatagg | 3480 |
| atgttaatca | aacaaagggc | agaaagaagc | ctgtgactat | ctgggctcga | gaagtcaagt | 3540 |
| atttcatgct | gggagtaaga | cgtaagccat | ggaaaaatgc | tctccgggca | tgaataaggc | 3600 |
| tgctggccat | gagccttttt | actcctgacc | tggtttntaa | gtagtttggt | attagggagc | 3660 |
| tggatcggag | ggaaggcttc | tgctgcatt  | ttgtatatac | tcactataa  | attgttcatg | 3720 |

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agtctgctgc gtgtagaaat agctgaagag ccagacacgt ttgaaggaaa cagtgcctttt 3840
ttaaagaaaa aaaaaaaaaa aagtcgacat cgatacgctt ggtcaatcac tagtgaattc 3900
gcggccgcct gcaggtcgac canaaggaga gctcccaacg cgtggagcaa gc 3952

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 <213> Sus scrofa

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 Glu Leu Ser Pro Pro Ser Ile Gln Pro Ala Lys Ser Glu Leu Ile Val  
 35 40 45  
 Ser Ala Gly Asp Glu Ile Arg Leu Phe Cys Thr Asp Pro Gly Ser Val  
 50 55 60  
 Lys Trp Thr Phe Glu Thr Leu Gly Gln Leu Ser Glu Asn Thr His Ala  
 65 70 75 80  
 Glu Trp Ile Val Glu Lys Ala Glu Ala Met Asn Thr Gly Asn Tyr Thr  
 85 90 95  
 Cys Thr Asn Glu Gly Gly Leu Ser Ser Ser Ile Tyr Val Phe Val Arg  
 100 105 110  
 Asp Pro Glu Lys Leu Phe Leu Val Asp Pro Pro Leu Tyr Gly Lys Glu  
 115 120 125  
 Asp Asn Asp Ala Leu Val Arg Cys Pro Leu Thr Asp Pro Glu Val Thr  
 130 135 140  
 Asn Tyr Ser Leu Thr Gly Cys Glu Gly Lys Pro Leu Pro Lys Asp Leu  
 145 150 155 160  
 Thr Phe Val Ala Asp Pro Lys Ala Gly Ile Thr Ile Lys Asn Val Lys  
 165 170 175  
 Arg Glu Tyr His Arg Leu Cys Leu His Cys Ser Ala Asn Gln Gly Gly  
 180 185 190  
 Lys Ser Val Leu Ser Lys Lys Phe Thr Leu Lys Val Arg Ala Ala Ile  
 195 200 205  
 Arg Ala Val Pro Val Val Ala Val Ser Lys Ala Ser Tyr Leu Leu Arg  
 210 215 220

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Glu | Gly | Glu | Glu | Phe | Ala | Val | Met | Cys | Leu | Ile | Lys | Asp | Val | Ser | Ser |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Ser | Val | Asp | Ser | Met | Trp | Ile | Arg | Glu | Asn | Ser | Gln | Thr | Lys | Ala | Gln |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Val | Lys | Arg | Asn | Ser | Trp | His | Gln | Gly | Asp | Phe | Asn | Phe | Leu | Arg | Gln |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |
| Glu | Arg | Leu | Thr | Ile | Ser | Ser | Ala | Arg | Val | Asn | Asp | Ser | Gly | Val | Phe |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |
| Met | Cys | Tyr | Ala | Asn | Asn | Thr | Phe | Gly | Ser | Ala | Asn | Val | Thr | Thr | Thr |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |
| Leu | Glu | Val | Val | Asp | Lys | Gly | Phe | Ile | Asn | Ile | Phe | Pro | Met | Met | Asn |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |
| Thr | Thr | Val | Phe | Val | Asn | Asp | Gly | Glu | Asp | Val | Asp | Leu | Ile | Val | Glu |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |
| Tyr | Glu | Ala | Tyr | Pro | Lys | Pro | Glu | His | Arg | Gln | Trp | Ile | Tyr | Met | Asn |  |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |
| Arg | Thr | Ala | Thr | Asp | Lys | Trp | Glu | Asp | Tyr | Pro | Lys | Ser | Glu | Asn | Glu |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |
| Ser | Asn | Ile | Arg | Tyr | Val | Ser | Glu | Leu | His | Leu | Thr | Arg | Leu | Lys | Gly |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |
| Thr | Glu | Gly | Gly | Thr | Tyr | Thr | Phe | Leu | Val | Ser | Asn | Ala | Asp | Val | Asn |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |  |
| Ser | Ser | Val | Thr | Phe | Asn | Val | Tyr | Val | Asn | Thr | Lys | Pro | Glu | Ile | Leu |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |  |
| Thr | His | Asp | Arg | Leu | Met | Asn | Gly | Met | Leu | Gln | Cys | Val | Ala | Ala | Gly |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |  |
| Phe | Pro | Glu | Pro | Thr | Ile | Asp | Trp | Tyr | Phe | Cys | Pro | Gly | Thr | Glu | Gln |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |
| Arg | Cys | Ser | Val | Pro | Val | Gly | Pro | Val | Asp | Val | Gln | Ile | Gln | Asn | Ser |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |
| Ser | Val | Ser | Pro | Phe | Gly | Lys | Leu | Val | Ile | His | Ser | Ser | Ile | Asp | Tyr |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |
| Ser | Ala | Phe | Lys | His | Asn | Gly | Thr | Val | Glu | Cys | Arg | Ala | Tyr | Asn | Asp |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |  |
| Val | Gly | Lys | Ser | Ser | Ala | Phe | Phe | Asn | Phe | Ala | Phe | Lys | Glu | Gln | Ile |  |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |  |
| His | Ala | His | Thr | Leu | Phe | Thr | Pro | Leu | Leu | Ile | Gly | Phe | Val | Ile | Ala |  |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |  |
| Ala | Gly | Met | Met | Cys | Ile | Ile | Val | Met | Ile | Leu | Thr | Tyr | Lys | Tyr | Leu |  |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |  |

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Lys | Pro | Met | Tyr | Glu | Val | Gln | Trp | Lys | Val | Val | Glu | Glu | Ile | Asn | 545 | 550 | 555 | 560 |
| Gly | Asn | Asn | Tyr | Val | Tyr | Ile | Asp | Pro | Thr | Gln | Leu | Pro | Tyr | Asp | His | 565 | 570 | 575 |     |
| Lys | Trp | Glu | Phe | Pro | Arg | Asn | Arg | Leu | Ser | Phe | Gly | Lys | Thr | Leu | Gly | 580 | 585 | 590 |     |
| Ala | Gly | Ala | Phe | Gly | Lys | Val | Val | Glu | Ala | Thr | Ala | Tyr | Gly | Leu | Ile | 595 | 600 | 605 |     |
| Lys | Ser | Asp | Ala | Ala | Met | Thr | Val | Ala | Val | Lys | Met | Leu | Lys | Pro | Ser | 610 | 615 | 620 |     |
| Ala | His | Leu | Thr | Glu | Arg | Glu | Ala | Leu | Met | Ser | Glu | Leu | Lys | Val | Leu | 625 | 630 | 635 | 640 |
| Ser | Tyr | Leu | Gly | Asn | His | Met | Asn | Ile | Val | Asn | Leu | Leu | Gly | Ala | Cys | 645 | 650 | 655 |     |
| Thr | Ile | Gly | Gly | Pro | Thr | Leu | Val | Ile | Thr | Glu | Tyr | Cys | Cys | Tyr | Gly | 660 | 665 | 670 |     |
| Asp | Leu | Leu | Asn | Phe | Leu | Arg | Arg | Lys | Arg | Asp | Ser | Phe | Ile | Cys | Ser | 675 | 680 | 685 |     |
| Lys | Gln | Glu | Asp | His | Ala | Glu | Ala | Ala | Leu | Tyr | Lys | Asn | Leu | Leu | His | 690 | 695 | 700 |     |
| Ser | Lys | Glu | Ser | Ser | Cys | Ser | Asp | Ser | Thr | Asn | Glu | Tyr | Met | Asp | Met | 705 | 710 | 715 | 720 |
| Lys | Pro | Gly | Val | Ser | Tyr | Val | Val | Pro | Thr | Lys | Ala | Asp | Lys | Arg | Arg | 725 | 730 | 735 |     |
| Ser | Ala | Arg | Ile | Gly | Ser | Tyr | Ile | Glu | Arg | Asp | Val | Thr | Pro | Ala | Ile | 740 | 745 | 750 |     |
| Met | Glu | Asp | Asp | Glu | Leu | Ala | Leu | Asp | Leu | Glu | Asp | Leu | Leu | Ser | Phe | 755 | 760 | 765 |     |
| Ser | Tyr | Gln | Val | Ala | Lys | Gly | Met | Ala | Phe | Leu | Ala | Ser | Lys | Asn | Cys | 770 | 775 | 780 |     |
| Ile | His | Arg | Asp | Leu | Ala | Ala | Arg | Asn | Ile | Leu | Leu | Thr | His | Gly | Arg | 785 | 790 | 795 | 800 |
| Ile | Thr | Lys | Ile | Cys | Asp | Phe | Gly | Leu | Ala | Arg | Asp | Ile | Lys | Asn | Asp | 805 | 810 | 815 |     |
| Ser | Asn | Tyr | Val | Val | Lys | Gly | Asn | Ala | Arg | Leu | Pro | Val | Lys | Trp | Met | 820 | 825 | 830 |     |
| Ala | Pro | Glu | Ser | Ile | Phe | Asn | Cys | Val | Tyr | Thr | Phe | Glu | Ser | Asp | Val | 835 | 840 | 845 |     |
| Trp | Ser | Tyr | Gly | Ile | Phe | Leu | Trp | Glu | Leu | Phe | Ser | Leu | Gly | Ser | Ser |     |     |     |     |

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850

855

860

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 865 870 875 880

Glu Gly Phe Arg Met Leu Ser Pro Glu His Ala Pro Ala Glu Met Tyr  
 885 890 895

Asp Ile Met Lys Thr Cys Trp Asp Ala Asp Pro Leu Lys Arg Pro Thr  
 900 905 910

Phe Lys Gln Ile Val Gln Leu Ile Glu Lys Gln Ile Ser Glu Ser Thr  
 915 920 925

Asn His Ile Tyr Ser Asn Leu Ala Asn Cys Ser Pro His Arg Glu Asn  
 930 935 940

Pro Ala Val Asp His Ser Val Arg Ile Asn Ser Val Gly Ser Ser Ala  
 945 950 955 960

Ser Ser Thr Gln Pro Leu Leu Val His Glu Asp Val  
 965 970

&lt;210&gt; 3

&lt;211&gt; 8

&lt;212&gt; PRT

&lt;213&gt; Sus scrofa

&lt;400&gt; 3

Pro Leu Leu Val His Glu Asp Val

1

5

&lt;210&gt; 4

&lt;211&gt; 936

&lt;212&gt; DNA

&lt;213&gt; Sus scrofa

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(936)

&lt;400&gt; 4

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accatcatca tcggcgtgcg caagggcggg acccgcgcgc tgctggagat gctcagcctg 240

catccccgacg tggctgctgc ggagaacgag gtgcacttct tcgactggga ggagcattac 300

agccaaggcc tggactggta cctcagccag atgcccttct cctacccgca ccagctcacg 360

gttgaaaaga cccccgcgta cttcacgtcg cccaaagtgc ctgagcgggt ccaccgcatg 420

aaccgtcca tccggctgct gctcatcctg cgggacccgt cggagcgcgt gctgtccgac 480

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| cacgtgcaca tgcagaactg gctgcgcttc ttcccgtgc gccgcatcca catcgtggat   | 660 |
| ggcgaccgcc tcatcagga cccttttctt gagatccaga aggtcgagag gttcctgatg   | 720 |
| ctgtcgccgc agatcaacgc ctcgaacttc tactttaaca aaaccaaggg cttttactgc  | 780 |
| ctgcgggacg gcggccggga ccgctgctta catgagtcca aaggccgggc gcacccccag  | 840 |
| atcgacccca aactcctcaa taaactgcac gaatattttc atgagccaaa taagaaattt  | 900 |
| ttcgagcttg tgggcagaac atttgactgg cactaa                            | 936 |

<210> 5

<211> 311

<212> PRT

<213> Sus scrofa

<400> 5

|   |  |
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| 20 25 30  |  |
| Glu Leu Val Arg Lys Ala Ala Thr Leu Gln Asp Glu Val Arg Asp Ser |  |
| 35 40 45  |  |
| Ala Ala Pro Asn Gly Ser Val Gln Gln Leu Pro Gln Thr Ile Ile Ile |  |
| 50 55 60  |  |
| Gly Val Arg Lys Gly Gly Thr Arg Ala Leu Leu Glu Met Leu Ser Leu |  |
| 65 70 75 80   |  |
| His Pro Asp Val Ala Ala Ala Glu Asn Glu Val His Phe Phe Asp Trp |  |
| 85 90 95  |  |
| Glu Glu His Tyr Ser Gln Gly Leu Asp Trp Tyr Leu Ser Gln Met Pro |  |
| 100 105 110   |  |
| Phe Ser Tyr Pro His Gln Leu Thr Val Glu Lys Thr Pro Ala Tyr Phe |  |
| 115 120 125   |  |
| Thr Ser Pro Lys Val Pro Glu Arg Val His Arg Met Asn Pro Ser Ile |  |
| 130 135 140   |  |
| Arg Leu Leu Leu Ile Leu Arg Asp Pro Ser Glu Arg Val Leu Ser Asp |  |
| 145 150 155 160   |  |
| Tyr Thr Gln Val Phe Tyr Asn His Val Gln Lys His Lys Pro Tyr Pro |  |
| 165 170 175   |  |
| Ser Ile Glu Glu Phe Leu Val Arg Asp Gly Arg Leu Asn Val Asp Tyr |  |
| 180 185 190   |  |



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Lys Ala Leu Asn Arg Ser Leu Tyr His Val His Met Gln Asn Trp Leu  
 195 200 205

Arg Phe Phe Pro Leu Arg Arg Ile His Ile Val Asp Gly Asp Arg Leu  
 210 215 220

Ile Arg Asp Pro Phe Pro Glu Ile Gln Lys Val Glu Arg Phe Leu Met  
 225 230 235 240

Leu Ser Pro Gln Ile Asn Ala Ser Asn Phe Tyr Phe Asn Lys Thr Lys  
 245 250 255

Gly Phe Tyr Cys Leu Arg Asp Gly Gly Arg Asp Arg Cys Leu His Glu  
 260 265 270

Ser Lys Gly Arg Ala His Pro Gln Ile Asp Pro Lys Leu Leu Asn Lys  
 275 280 285

Leu His Glu Tyr Phe His Glu Pro Asn Lys Lys Phe Phe Glu Leu Val  
 290 295 300

Gly Arg Thr Phe Asp Trp His  
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 agcctgggcg cgcccggcgg ccgcgcgccg cccgacgacc tggacctctt cccacgccc 180  
 gacccgcact acgagaagaa gtactacttc ccggtgcgcg agctggagcg ctcgctgcac 240  
 ttcgacatga agggcgacga cgtgatagtc ttcttgaca tccagaaaac gggcggcacc 300  
 accttcggcc gtcacctcgt gcagaacgtg gcctcgcagg tgccctgcga ctgccggccc 360  
 ggccagaaga agtgcacctg ctaccggccc aaccgcgcg agacctggct cttctccgc 420  
 ttctccacgg gctggagctg cggactgcac gccgactgga ccgagctcac caactgcgtg 480  
 cccggcgctg tggaccgccg cgaccccgcc gcgctgcgca cgccaggaa gttctactac 540  
 atcacctgc tgcgagacc cgtgtcccg tacctgagtg agtggcggca tgtacagcgg 600  
 ggggccacat ggaagacgtc gctgcacatg tgtgacgggc gcacgccac cctgaggag 660  
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gccaaagaaga acctgcgggg catggccttc ttcggcctga ccgagttcca gcgcaagacg      900
cagtacctgt tcgagcggac gttcaacctc aagttcatcc ggcctttcat gcagtacaac      960
agcacgcgag cgggtggcgt ggaggtgggt gaggacacca tccggcgcat tgaggagctc    1020
aacgacctgg acatgcagct gtacgactac gccagggacc tcttcagca gcgctatcag    1080
tacaagcggc agctggagcg ccggcagcag cgctccgga gccgcgagga gcgctgctg     1140
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Arg | Arg | Arg | Arg | Ala | Gly | Ser | Arg | Thr | Met | Val | Glu | Arg | Ala | Ser |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Lys | Phe | Val | Leu | Val | Val | Ala | Gly | Ser | Ala | Cys | Phe | Met | Leu | Ile | Leu |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Tyr | Gln | Tyr | Ala | Gly | Pro | Gly | Leu | Ser | Leu | Gly | Ala | Pro | Gly | Gly | Arg |
|     | 35  |     |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Ala | Pro | Pro | Asp | Asp | Leu | Asp | Leu | Phe | Pro | Thr | Pro | Asp | Pro | His | Tyr |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Glu | Lys | Lys | Tyr | Tyr | Phe | Pro | Val | Arg | Glu | Leu | Glu | Arg | Ser | Leu | His |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Phe | Asp | Met | Lys | Gly | Asp | Asp | Val | Ile | Val | Phe | Leu | His | Ile | Gln | Lys |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Thr | Gly | Gly | Thr | Thr | Phe | Gly | Arg | His | Leu | Val | Gln | Asn | Val | Arg | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Glu | Val | Pro | Cys | Asp | Cys | Arg | Pro | Gly | Gln | Lys | Lys | Cys | Thr | Cys | Tyr |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Arg | Pro | Asn | Arg | Arg | Glu | Thr | Trp | Leu | Phe | Ser | Arg | Phe | Ser | Thr | Gly |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Trp | Ser | Cys | Gly | Leu | His | Ala | Asp | Trp | Thr | Glu | Leu | Thr | Asn | Cys | Val |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Pro | Gly | Val | Leu | Asp | Arg | Arg | Asp | Pro | Ala | Ala | Leu | Arg | Thr | Pro | Arg |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |

FRAV20030009 US NP Sequence Listing.txt

Lys Phe Tyr Tyr Ile Thr Leu Leu Arg Asp Pro Val Ser Arg Tyr Leu  
180 185 190

Ser Glu Trp Arg His Val Gln Arg Gly Ala Thr Trp Lys Thr Ser Leu  
195 200 205

His Met Cys Asp Gly Arg Thr Pro Thr Pro Glu Glu Leu Pro Pro Cys  
210 215 220

Tyr Glu Gly Thr Asp Trp Ser Gly Cys Thr Leu Gln Glu Phe Met Asp  
225 230 235 240

Cys Pro Tyr Asn Leu Ala Asn Asn Arg Gln Val Arg Met Leu Ala Asp  
245 250 255

Leu Ser Leu Val Gly Cys Tyr Asn Leu Ser Phe Ile Pro Glu Gly Lys  
260 265 270

Arg Ser Gln Leu Leu Leu Glu Ser Ala Lys Lys Asn Leu Arg Gly Met  
275 280 285

Ala Phe Phe Gly Leu Thr Glu Phe Gln Arg Lys Thr Gln Tyr Leu Phe  
290 295 300

Glu Arg Thr Phe Asn Leu Lys Phe Ile Arg Pro Phe Met Gln Tyr Asn  
305 310 315 320

Ser Thr Arg Ala Gly Gly Val Glu Val Gly Glu Asp Thr Ile Arg Arg  
325 330 335

Ile Glu Glu Leu Asn Asp Leu Asp Met Gln Leu Tyr Asp Tyr Ala Arg  
340 345 350

Asp Leu Phe Gln Gln Arg Tyr Gln Tyr Lys Arg Gln Leu Glu Arg Arg  
355 360 365

Gln Gln Arg Leu Arg Ser Arg Glu Glu Arg Leu Leu His Arg Ala Lys  
370 375 380

Glu Ala Pro Pro Arg Gly Asp Thr Glu Glu Pro Gly Arg Val Pro Thr  
385 390 395 400

Glu Asp Tyr Met Ser His Ile Ile Glu Lys Trp  
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FRAV20030009 US NP Sequence Listing.txt

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<210> 11  
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FRAV20030009 US NP Sequence Listing.txt

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| <210> 16   |    |
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| gcacccccag atcgacccc                                       | 19 |
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| <211> 23   |    |
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| <210> 18   |    |
| <211> 48   |    |
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| <211> 52   |    |
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| gggaccactt tgtacaagaa agctggggttt agtgccagtc aaatgttctg cc | 52 |
| <210> 20   |    |
| <211> 19   |    |
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| <400> 20   |    |
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| <210> 21   |    |
| <211> 23   |    |
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FRAV20030009 US NP Sequence Listing.txt

|                                |    |
|--------------------------------|----|
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| <210> 22                       |    |
| <211> 25                       |    |
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| <400> 23                       |    |
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| <210> 24                       |    |
| <211> 28                       |    |
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| <400> 24                       |    |
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| <210> 25                       |    |
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| <210> 26                       |    |
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| <400> 26                       |    |
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| <210> 27                       |    |
| <211> 16                       |    |
| <212> DNA                      |    |
| <213> Sus scrofa               |    |
| <400> 27                       |    |
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FRAV20030009 US NP Sequence Listing.txt

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 <213> Sus scrofa  
  
 <400> 31  
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FRAV20030009 US NP Sequence Listing.txt

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55